THE EFFECT OF EMOTIONALLY TONED LITERATURE VOCALLY EXPRESSED, UPON AN AUDIENCE

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DISSERTATION

PRESENTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN THE GRADUATE SCHOOL OF THE OHIO STATE UNIVERSITY

BY

LESTER RAINES, A. B., A. M.

The Ohio State University
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TABLE OF CONTENTS

		Page
I.	INTRODUCTION.	5
II.	HISTORICAL INTRODUCTION	6
III.	PURPOSE OF THE PRESENT STUDY.	11
IV.	THE EXPERIMENT: Materials and Procedure	12
V.	EXPERIMENTAL RESULTS.	19
VI.	CONCLUSIONS	31
	BIBLIOGRAPHY	
	AUTOBIOGRAPHY	

PREFACE

This paper is concerned with a study of the effects of the speaker's voice upon the audience. It is an attempt to correlate the writer's experience in public speaking and dramatics, with psychological procedure, in an effort to determine how well the auditor is able to discriminate the emotion expressed by the speaker or actor.

The writer wishes to express his indebtedness to Dr. A. S. Rogers for suggesting the problem, the helpful criticism she has given; to the various colleagues and many students who have acted as observers; to Dr. George F. Arps for assistance in providing facilities without which the experiment would not have been possible; to Mrs. Frances Clark of the Victor Talking Machine Company for suggestions and criticism; to Dr. Georgiana S. Gates for permission to use the record made at Bernard College; to Mr. Lynn Morrow, Miss Isabelle Ruehrmund, and Miss Phoebe Paine, for assistance in tabulating the data; and to Dr. Henry H. Goddard for final supervision.

THE EFFECT OF EMOTIONALLY TONED LITERATURE, VOCALLY EXPRESSED, UPON AN AUDIENCE

I. INTRODUCTION.

A. Importance of Emotion to Psychology and other fields.

In surveying the mass of literature in psychology and kindred fields upon the topic of emotion, it was found that there were many differing opinions and classifications. All, however, were agreed as to the importance of emotion in expressing one's meaning to another individual. The fields of psychology and speech or dramatics have much in common in this respect.

Dr. George P. Baker of Yale (3) says, "Accurately conveyed emotion is the great fundamental of all good drama. It is conveyed by action, characterization, and dialog." Other texts in speech are equally emphatic in the stress they lay upon the emotional element in speaking although they recommend widely differing methods of training for the successful transfer of idea from speaker to audience. Likewise in psychology, the journals contain reports of many experiments and theories concerning the emotions in relation to expression.

It is the object of this study to work out by psychological methods the effects of certain speech stimuli upon an audience, thus ascertaining their reactions to the emotions expressed by the speaker's voice.

B. Elements of Emotional Expression.

The various factors which carry the speaker's meaning and affective tone to an audience are three in number: gestures, facial expression and voice. Various schools of speech training stress proficiency in one or another of these factors as the most effective method for equipping speakers and actors with the necessary tools for their work.

Only by a coordination of all three factors, voice, facial expression, and gesture, can the speaker or

actor succeed, but for this study, only one, (the voice) has been investigated. It is hoped that future investigators will study the elements as coordinated, possibly with the aid of the cinema, in order to reproduce the actual speech situation under controlled conditions for scientific investigation.

II. HISTORICAL INTRODUCTION

A. Pioneer work.

Among the first to mention the problem of the expression of emotion was Charles Darwin.(8) He was the first to attempt to put down in any scientific fashion the facial expressions of human beings, as well as lower forms, while undergoing certain affective states. Since his time the attention of psychologists and dramatic writers has been focused upon this phase of expression. Both French (26) and German (29) writers took up in detail the description of facial changes during emotions, notably Pederit (1888) and Rudolph (1903). From the work of the former, Wilhelm Wundt made up for laboratory experimentation, a model of a man's head with changeable brow, eye, and mouth sections, each of which or in various combinations meant different things to the observer. This model was further modified by Boring and Titchener (33) and used in experiments at Cornell and Pennsylvania.(16) Buzby(7) in an experiment with this model in 1924 reported that "anger and dismay" do not give a high percentage of correct responses, but that "horror, disdain, disgust and bewilderment" do. He also stated that women are slightly in advance of the men in discrimination and that the upper part of the face is more important for correct judgment than the mouth. Aubert (2) and Winds (34) carry on the early traditions in France and Germany by listing the various facial expressions and gestures needed to convey emotions to the audience.

B. Experiments using photographic methods.

More recent experiments may be grouped by the method used in investigation. The photographic method was among the first used and was of two sorts; - first,

actual photographs of the individual experiencing the emotion and second, the recognition by an observer of another individual's emotional state as thus photographed. Feleky at Columbia (9,10) had photographs made of one subject while reading various emotional selections, and Landis at Dartmouth (18) with 19 subjects and later at Minnesota (19) with 25 subjects tried a similar method. The former found positive correlation between introspections and facial expression while the latter was equally emphatic in concluding that the subject's facial expressions and introspective reports did not agree with the "conventionalized expressions which social usage requires."

The method of judgment of facial expression was used in investigations by Feleky (1914), Langfeld(1918) Allport (1924), Ruckmick (1921), and Gates (1923). Feleky gave as a later experiment certain of the photographs obtained from earlier studies to various observers and reported that their responses were determined by "their assuming the same mental and bodily attitudes as the photograph." Langfeld (22) with only a few observers and using the photographs made by Rudolph (29) found that the emotional states were best identified in the following order:

1. Laughter
2. Amazement
3. Bodily Pain
4. Hate (Aversion)
5 Fear
6. Disgust
7. Doubt
8. Anger

Allport (1) upon repeating this experiment with a larger number of subjects using a smaller group of photographs found the order somewhat changed:

1. Laughter
2. Bodily Pain
3. Fear
4. Distrust (Hate)
5. Amazement
6. Anger
7. Doubt
8. Disgust

Ruckmick (28) found that in naming certain facial expressions from photographs of an experienced campus actress that the observers were more uniform in the "Primary emotions such as love, hate, joy and sorrow, than the secondary ones, like repulsiveness, surprise, distrust, and defiance," and that the moods of the observer influenced judgment. Sherman (30) in showing the moving pictures of infants in certain emotional

reactions reports negative results. Dr. G. S. Gates, (12) using a series of six photographs in an experiment with children of various grades found that the correctness of their responses increased with age and grade.

C. Experiments using test methods.

Aside from the method of judging facial expression, the next most important experimentation has been in group tests or questionnaire studies. Woodworth, Downey, and Pressey are pioneers in this field with more recent work by Laird, Freyd, Ream, Mathews, Moss and Watson. Miss Washburn has contributed several studies of a similar nature. All of the tests to date, however, await further standardization before they can be said to reliably measure emotionality, stability and the like.

D. Physiological changes.

Physiological changes during emotion have also come in for a considerable amount of the experimenter's attention, especially those changes which can be measured objectively. Blood pressure and respiration consequently are the most commonly studied.

Landis (18) reported a continuous systolic blood pressure method in connection with his studies of facial expression and then in a later study (20) used this apparatus to support the following conclusions:

1. That changes of systolic blood pressure are likely to happen in unemotional situations.
2. There are no types of individual blood pressure reactions.
3. Surprise is the only stimulation that gives a definite vascular reaction.
4. Blood pressure has no part in the upset following emotions.
5. There are no sex differences in reactions.
6. The I/E ratio offers evidence of significant difference between truth and falsehood.
7. Six excitement, surprise, and fear usually give rise to a change in blood pressure; anger and disgust, no change.

These are regarded as chance findings.

Later with Wiley (21), Landis found that blood pressure and breathing records gave negative results in the detection of deception in contrast to the previous work of Burtt (6) who found that systolic blood pressure had a greater diagnostic value than breathing. Burtt suggested that the lying consciousness appears to have an emotional content and expressive measurements may be influenced by emotional control.

Marston (1917) found (24) that blood pressure was a practically infallible test of a conscious attitude of deception. He later (1924) built up a theory of emotions based upon his systolic blood pressure studies. Marston stated that fear and anger are the only mental processes that can cause moderate rise of blood pressure.

Larsen found (23) that blood pressure determinations were not infallible in deception; neither are galvanometer records. A cardo-pneumo-psychogram, however, is very useful in the study of the emotions.

Felsky studied (10) the effect of certain emotions,--wonder, fear, pleasure, pain, anger, and laughter, upon the respiratory curve. Using only 5 subjects she found rather interesting correspondences between the curves taken during the expression of the various emotions.

E. The effect of Voice and Music.

In music, however, several studies showing the effect of musical records upon certain physiological processes of the observer have been made. In 1906 the Wellesley psychology laboratory (11) studied the effect of various musical records upon thoracic breathing. In 1923 Hyde (15) at the University of Kansas found that the effect of certain musical records could be measured by galvonometer and sphygmomanometer with fairly good results.

The most recent account of experiments in music, (17) shows a remarkable amount of experimentation along general lines, but practically none along emotional lines.

In voice work alone, that is the speakingvoice, several experiments have been reported both by physical and recognition methods. In an unpublished study at the University of Wisconsin, Borchers (4) found that in reading (aloud and silently) and listening to comedy, tragedy, and unemotional material, individuals tended to vary considerably in their types of reactions in blood pressure readings, but that each individual tended to react in the same way when the experiment was repeated. The results were shown in form of graphs. Additional graphs were made of blood pressure during the taking of oral examinations for the Master of Arts degree with decidedly interesting results.

In an unpublished thesis at the School of Speech at Northwestern University, Buehler (5) working on the creation of dramatic atmosphere by the reader, studied the effect of vocal tones on the audience with the speaker standing behind a screen and then in front of the screen. The auditor's judgments were purely subjective and were not checked by any physiological measurements. Buehler found when it came to judging the emotion which the speaker tried to portray that action alone ranked the highest, that voice alone ranked next, and voice and action lowest. In percentages, he found that the subjects reported 71.9% correctly on voice only, 82.2% on action only, and 80.4% correctly when voice and action were combined.

Skinner (32) in an unfinished doctoral dissertation at the University of Wisconsin is developing an apparatus (the oscillograph) for recording and computing the intensity of the voice and checking the effects of emotion on the voice as shown in frequency and intensity.

The matter of conveying the emotion of a speaker by voice in such a manner that the auditors will be aware of the speaker's meaning, has not been studied in any complete manner. Sherman (31) and Buehler (5) used the individual's voice which was subject to chance variations in time, pitch and rate and Gates (13) used a phonograph for the purpose. The Gates' experiment and

use the present study are the only two which have been conducted along similar lines.

It is indeed curious when one considers the role that the speaking voice plays in the transmission of ideas that so little has been attempted in testing its effect as a medium of affective expression.

III. PURPOSE OF THE PRESENT STUDY.

The aim of the present study is to ascertain how well an audience recognizes or discriminates the emotion expressed by the speaker's voice. As the voice is the most frequently used of man's means of conveying thought, it is only proper that the possibilities of expressing emotion by vocal means be investigated.

Previous experimentation does not attack this problem in any satisfactory manner. The voice of a speaker cannot be kept exactly the same during subsequent repetitions of an experiment, as is reported by several experimenters, therefore a phonographic reproduction is the only feasible one. Dr. Gates is the only experimenter whose work corresponds to this and her work (13) was confined to the grade school levels. Dr. Gates recordeis subject to the criticism that extraneous expressions in the record tend to serve as cues for the observer. This factor it was deemed well to eliminate.

In addition to answering the question of how much of the speaker's emotion is carried over to his auditors, this study is concerned with preliminary steps toward finding a test for selecting students of dramatic ability, modeled somewhat after the Seashore Music Tests.

The study also undertakes to investigate blood pressure and respiratory curves, as a check on the impressive methods suggested above.

IV. THE EXPERIMENT

Materials and Procedure

A. Making the record.

The record was made in the Victor Talking Machine Company laboratories, Camden, N.J., with the kind co-operation of Mrs. Frances Clark, Educational director.

The material used was seven selections from literature which deal with mirth, fear, rage, scorn, admiration, personal grief, and mourning, as well as seven alphabets using the same intonations. Three additional alphabets, self-assertion, indignation, and mad rage, were inserted in order to complete the time allotment, -- $3\frac{1}{2}$ minutes for a ten inch record.

Each selection took 20 seconds and was practiced carefully before delivery. In spite of all precautions, the third alphabet, that of "scorn", was not spoken correctly and was consequently discarded in the final results. Care was taken also to avoid the custom of the Bernard (13) record in which various ejeculations aided the discrimination of the auditor.

The following material was read in making the O. S. U. record:

Selection I. Terror or Fear

"Shall I not then be stifled in the vault
To whose foul mouth no healthsome air breathes in?
. . . . . .
Where for these many hundred years, the bones of
all my buried ancestors are pack'd
Where bloody Tybalt, yet but green in earth
Lies festering in his shroud; where as they say
At some hours in the night, spirits resort."
-- Romeo and Juliet - IV. iv. 33-4, 405.
(Juliet's potion scene.)

Selection II. Mirth

"Get ye all three into the box-tree; Malvolio's coming down this walk. He has been yonder in the sun practising behavior to his own shadow this

half hour. Observe him for the love of mockery."
-- Twelfth Night - II. v. 18-22. (Maria's speech).

Selection III. Personal Grief

"My Captain does not answer, his lips are pale and still
My father does not feel my arm, he has no pulse or will".
-- Whitman's - O Captain, My Captain, - Stanza 3. lines 17 - 18.

Selection IV. Rage

"How like a fawning publican he looks!
I hate him for he is a Christian
If I can catch him once upon the hip I will
Feed fat the ancient grudge I bear him.
He hates our sacred nation and he rails on me.
Cursed be my tribe if I forgive him!"
-- Merchant of Venice - I. iii, 41-2. 46-8, 51.
(Shylock speaking of Antonio.)

Selection V. Scorn

"He had a fever when he was in Spain
And when the fit was on him I did mark
How he did shake; 'tis true, this god did shake."
-- Julius Caesar - I. ii. 119-21.
(Cassius concerning Caesar)

Selection VI. Admiration.

"Hang there my verse in witness of my vow;
And thou, thrice crowned queen of night,
Survey with thy chaste eye from thy pale sphere above
The huntress' name that my full life doth sway."
-- As You Like It - III, ii, 1-4.
(Orlando hanging verses on trees)

Alphabet 1. -- Admiration (Same as Selection VI)
Alphabet 2. -- Sorrow. (Same as Selection VII)
Alphabet 3. -- Discarded due to fault in making record.
Alphabet 4. -- Hate. (Same as Selection IV)
Alphabet 5. -- Personal Grief. (Same as Selection III)
Alphabet 6. -- Mirth. (Same as Selection II)
Alphabet 7. -- Fear. (Same as Selection I)

Selection VII. Mourning.

"Confusion now hath made his masterpiece!
Most sacrilegeous murder hath broke ope
The Lord's anoSnted temple, and stole thence
The life o' the building."
-- Macbeth - II, iii. 71-4.
(Macduff speaking of Duncan's murder)

Alphabet 8. -- Self Assertion.
Alphabet 9. -- Indignation.
Alphabet 10 -- Mad Rage

Made by Victor Talking Machine Company, Camden, N.J. as VICTOR SPECIAL RECORD (for private use only) No. Bve 42558-2.

B. Materials.

For this investigation two records were used, the Barnard College record -- Victor Eve-35307-2 and the Ohio State record, Victor Bve-42558-2. Both records are orthophonic electric recordings and were presented to the observers with the aid of a standard electric orthophonic victrola.

As a means of recording the observers' reactions, four mimeographed forms, A,, B., C., and D., - were devised after laboratory studies of various methods had been tried.

Form A. Contains blanks for certain census information such as name, class, age, sex, college, class, and nationality and the following questions:

1. Are you slow, medium, or quick in reacting to emotional stimuli?
2. Does music affect you emotionally?
3. Do sad moving pictures affect you?
4. Do you prefer happy endings to plays and novels?
5. How much dramatic experience have you had? In High School? In College?
6. Are you a member of any dramatic organization? If so, name it.
7. How much training have you had in public speaking or elecution? Specify.
8. Which do you think expresses emotion best in actors? Facial expression, Voice, or Gestures?

9. What mood are you in today? (Agreeable, disagreeable, blue, happy, depressed, discouraged, are suggested terms.)

In addition this form also carried a list of forty-eight possible emotional terms (determined by a previous study) arrayed in ten groups each containing similar terms. This list could be folded over the edge of forms B and C and served as an aid in answering them.

Each form was of a different color, A-pink, B-yellow, C-white, D-blue, and contained a space for the name of the observer. This enabled the experimenter in the first case to keep separate the various forms and in the second to keep the results of each observer together.

Form B. contained blanks for recording reactions to the Barnard record with an indication of the arrangement of letters used for each emotional presentation. Space was allowed for a recording of a second impression if upon the second playing of the record a different judgment was made.

Form C. served a similar function for the Ohio State record with the addition of the following questions to be answered when the second playing was completed:

I. How did you recognize the emotional tone of the selections? By pitch, Familiar inflection, Because of training, or other reason?

II. Which seemed easier to discriminate or to interpret, Selections or Alphabets?

III. How did this record affect you? Please be specific. On this form the selections were designated by Roman, and the alphabets by Arabic, numerals.

Form D. was devised for later use and omitted certain questions used on Form A. in lieu of which it was used. Only the emotional terms actually used in the record were listed making the problem for the auditor somewhat different from the first method in which the observer might choose a proper term from a large list of emotional terms.

For the individual tests given later a Tycos sphygmomanometer was used for blood pressure readings and a pheumograph and tambour connected with a kymograph for the recording of respiration.

C. Group Method.

Two methods were employed in this experiment, (1) group and (2) individual. For the group experiment the following procedure was used:

The Barnard record was played first as a practice record, but later experimentation showed that it might be used as part of a general score in conjunction with the Ohio State record. 900 students in elementary and intermediate psychology were used as observers, and were given the test in groups of from 30 to 70.

Form A. was passed out and read to the students, and time allowed in which to answer the questionsas they progressed. It was then suggested that the students look at the list of possible emotional terms. The arrangement was explained and the list read through. Then form A was so folded that the blank spaces on Form B which had been passed out could be seen, as well as the list of possible emotional terms. The following directions were given. "On this record, there are ten emotionally toned alphabetical sets. The letters that are on this yellow blank indicate the portion that is given to each sort of expression. For example, the first one used a b c d and then "a" on thru to "z", but the second one, uses the alphabet differently and breaks it up into combinations listed on the blank.

"Now you are to use the list on the information blank and write in the first column the emotion which you think or feel that the speaker in this record is trying to express. Please list it in the place labeled 'first time.' If you don't get it the first time, we will play the record a second time, and then you may list anything that you have omitted the first time played. Now if there is anything in the record that you think has been omitted in the list of emotional terms please do not be afraid to list your own reaction in the space allowed. One more caution, please refrain from indicating in any way to your neighbor, your own reaction to the record. Please do not laugh or cry, or anything of that sort. This is an experiment and we are asking you to give it your very careful attention and cooperation."

The record was played through twice and Form C. passed out. The directions here were very similar to those written at the top of the form. They were: "In the first place, please be sure that your name is at the top of the yellow sheet, as well as on the top of the pink sheet. The mark in this particular experiment will not be used against you as far as your grade is concerned, but we would like to have your names on these various forms in the case they get separated. The directions for this record are 'In the space below, please list the emotions you think or feel the speaker is trying to express by means of voice in the record. Now you will note a difference in this from the other record, as we tried selections from literature and also alphabets. There are seven selections, six from Shakespeare and one by Walt Whitman. They are given in the order which you will notice indicated along the side of the page. There are six selections from literature, then seven repetitions of the alphabet, then one selection from literature, and then three alphabets. We shall play the record through twice. The first time, please record in column one what you think it is, using the list on the pink sheet to help you. When we play it the second time you may fill in your first attempts if you so desire, being sure to use the second column. Otherwise, leave it empty. The same emotion may be used more than once in the record. That is, it may be used in a selection and it may be used in an alphabet. The list of emotional terms may be useful, but if you feel that the emotion is not listed, please list your impression. Please be fair and answer to the very best of your ability.'"

After being allowed sufficient time to complete the answers to the questions on Form C, the observers were excused and their papers collected as they left the room.

A modification of this method was used later upon 78 students using Form D. Some students objected to the fact that there were too many emotional terms on the pink sheet. In order to scertain if observers could better make records if they were given only the

terms which fitted into the places, Form D was administered to 78 students who had not heard the record before. In Form D the directions were modified from those stated above to include the information "that in the first record there are ten selections of the following list, numbered so that if you prefer you can fill in the blanks with either numbers or names, and for the second record the names of the various selections and the various alphabets also numbered for ease in filling in the blanks."

Otherwise the administration of the experiment was precisely as previously given. In every case when the phonograph was set up in a new room, the motor was tested by means of a stroboscopic disk furnished by the Victor Company to insure a uniform speed of 78 revolutions per minute.

D. Individual method.

The second method was an individual one using 62 observers who had already heard the record in groups. In this case the phonograph was moved into a small room in the laboratory and a kymograph, pneumograph and sphygmomanometer were used. The observer was seated comfortably facing an open window, with his left hand resting on the table with the blood pressure apparatus attached to his left arm, and the pneumograph attached around his chest.

Thoracic breathing only was measured in this particular instance. Blood pressure was taken by means of a Tycos sphygmomanometer, and the pulse detected by the palpation method.

Several assistants were at hand to facilitate the attachment and removal of apparatus. As they listened to the record (the Ohio State record only being used in this particular part of the experiment) the observers were asked to try to place themselves as much in the situation of the speaker as they could. At the same time they were supplied with a list of emotions which might be portrayed and a mimeographed sheet upon which were listed the words or alphabets which were in the record.

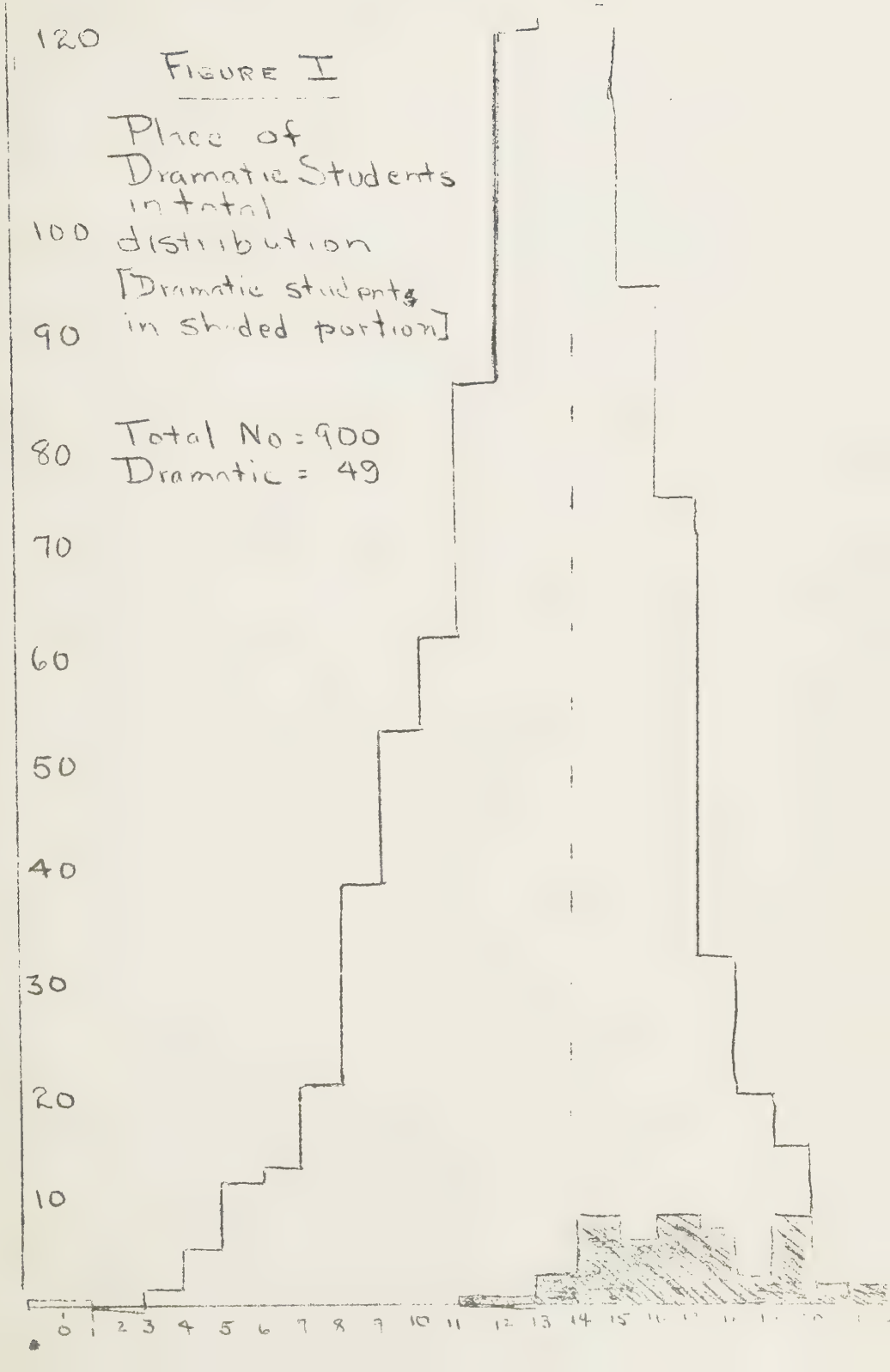
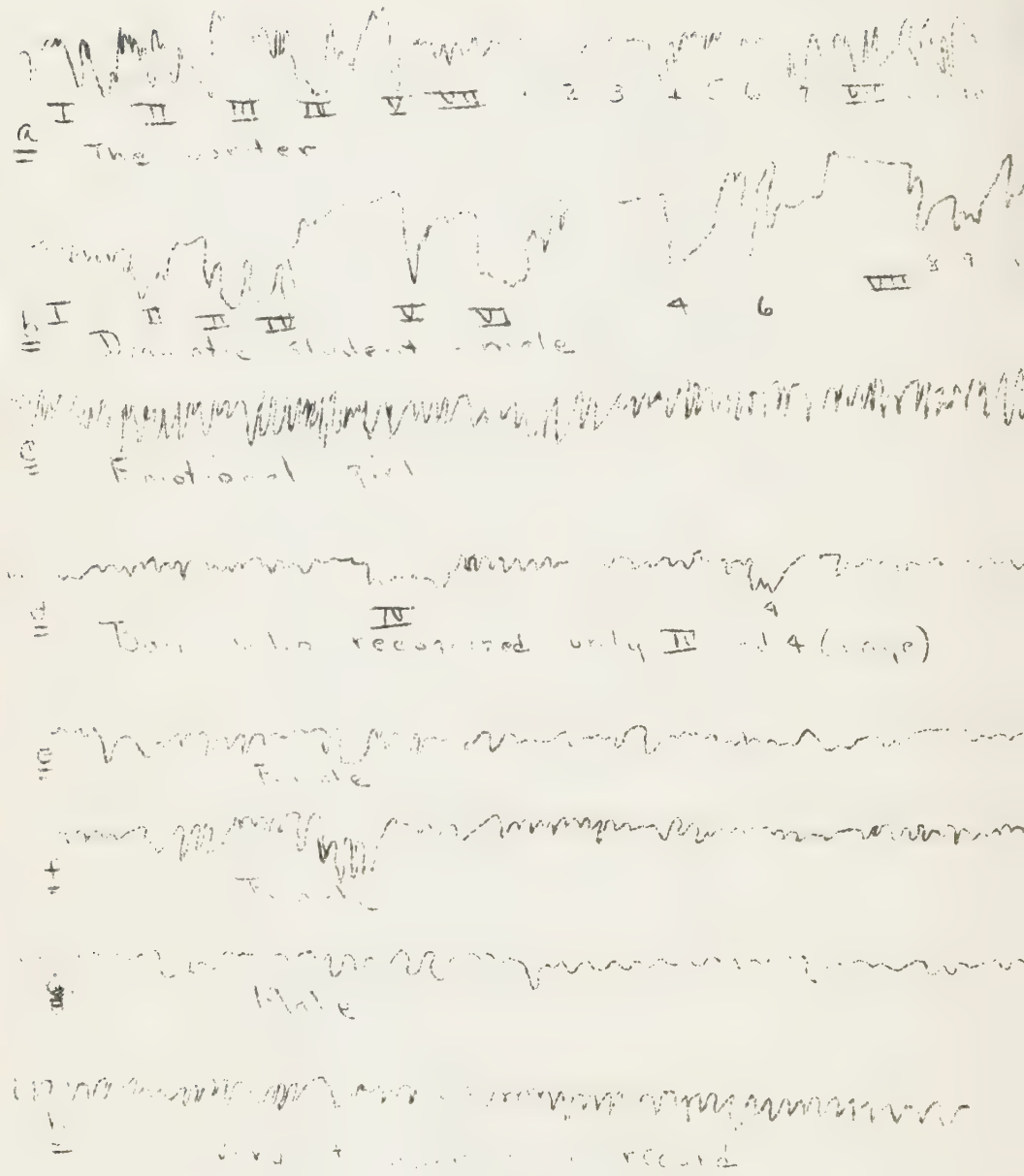


FIGURE I

Place of Dramatic Students in total distribution

[Dramatic students in shaded portion]

Total No: 900
Dramatic = 49



Some of the mo

FIGURE

I

c. Dramatic student - who had read twice previously.

Selection from Alcott

Play expression

Fear

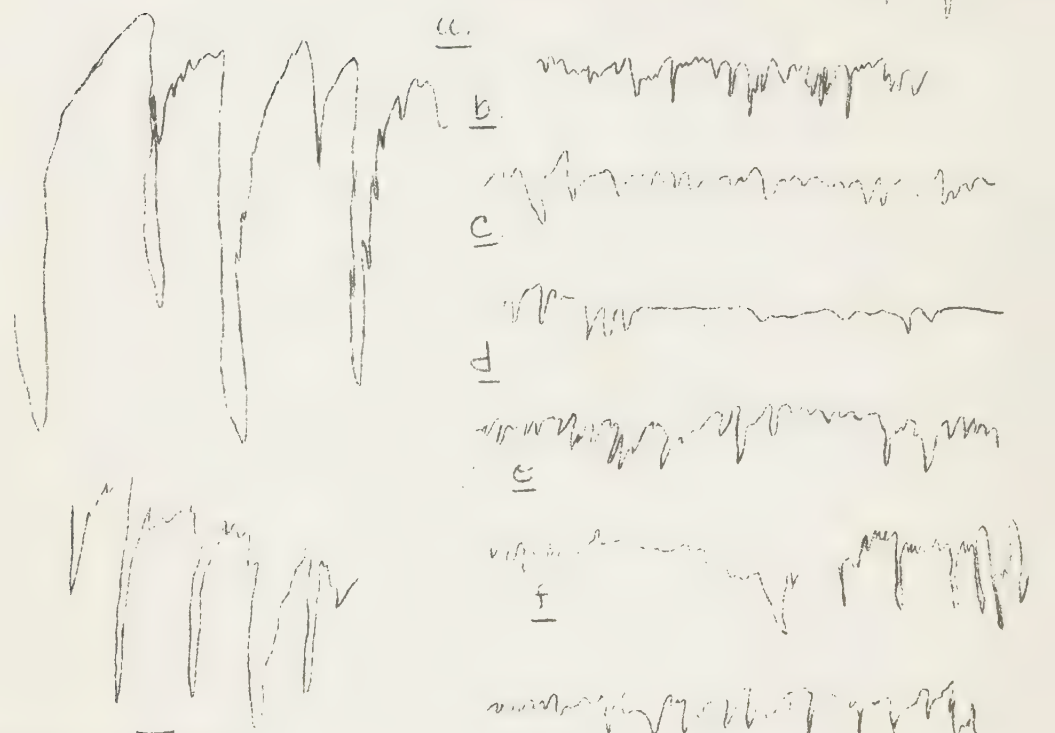
Silently

d. Interested only

h. Typical record - no affect

Striking pneumograph records

II



After Feleky
Exp Psych. 1916, [illegible]35

Breathing Curves during Laughter

Victor record
62576-B

Figure III

The Blood Pressure of the observers was taken at the beginning of the record, at the end of the fourth selection, rage, (which was deemed an exciting stimulus) and at the end of the record. For a small number, 12 of the observers, a laughing record, Victor record No. 62576-B, made by a Norwegian artist was played for additional experiment. In this record the recorder laughed very heartily. The record was found very effective in stimulating mirth in the observers. Blood pressure was taken at the end of this record.

V. EXPERIMENTAL RESULTS

I. Group Method

A. Establishing norms and scoring

The responses of the 900 observers who heard the two records were recorded and tabulated with a view to establishing norms. It was found that in all but a few instances the judgment of the experimenter had been correct in giving a certain vocal inflection to the various emotions.

The Barnard record was least effective in the rendition of defiance, surprise, and pity; and the Ohio State record was least effective in scorn and admiration for the Selections and in defiance and fear for the Alphabets. These defects should be remedied in future records before any adequate standards can be set up. The papers of each observer were then scored in accordance with standards set by the results of the tabulation and a combined score given: 10 on Barnard, 7 on Selections, and 9 on Ohio State Alphabets, making a possible score of 26. The highest score made by any of the 900 was 23 and the lowest 0. The median score was 14.

Table I shows the final distribution of total scores.

Table I.

TOTAL SCORES ON COMBINED RECORDS
Possible score 26 ; 900 cases

No. of Correct Answers	MALE	FEMALE	TOTAL
0	1	0	1
1	1	0	1
2	0	0	0
3	0	0	0
4	2	0	2
5	3	2	5
6	6	5	11
7	11	2	13
8	16	4	20
9	26	13	39
10	38	15	53
11	41	21	62
12	43	42	85
13	70	50	120
14	59	63	122
15	61	62	123
16	37	58	95
17	29	46	75
18	11	22	33
19	7	13	20
20	3	12	15
21	0	2	2
22	1	1	2
23	1	0	1
24	0	0	0
25	0	0	0
26	0	0	0

Median for women - 14-15
men - 13
both - 14

B. Dramatic Students.

The records of those students who had stated that they had had considerable dramatic training or experience in dramatics, were next examined, with the following results:

Table II.

DRAMATIC STUDENTS

Total Score	Male		Female		Total
	Fresh-man	Upper classmen	Fresh man	Upper classmen	
23		1			1
22		1	1		2
21				1	1
20	1	1	4	2	8
19		1	1	1	3
18		1	2	4	7
17	2	2	2	2	8
16	2	2	1	1	6
15	3	2	2	1	8
14		1	2		3
13				1	1
12				1	1
Totals	8	12	15	14	49
Medians	16	17	18	18	17

From the above figures it is evident that students who have had dramatic experience rate much higher on this particular sort of test than the other individuals. The two ranking lowest were interviewed. It was found that one girl had been greatly disturbed and her reactions probably altered by the remarks of a boy who sat next to her; and the other low score was that of a woman who for some years had been a director of dramatics in a small college and whose introspective report stated that she had been very much interested in figuring out what was intended by the test and how the results were obtained in each case. In all other cases, save these two, the dramatic students were all above the median for the total number of students. The highest scores made among the total 900 were made by the dramatic students. The writer is not concerned with the question of whether this dramatic ability may be innate or acquired but since there is very little opportunity for actual training at the particular institution studied, one is open to conviction. In any

event, very little actual class room instruction in vocal training has been afforded to any of the upper classmen.

The writer is confident that with further standardization and adjustment in test procedure, a similar method may be used effectively in detecting students with dramatic ability. It is logical to conjecture that such ability can be tested in this way, as students can be tested for musical aptitude with appropriate records. The results of this study are at least indicative of possibilities in this direction. The relation of the dramatic students to the remainder of the 900 is shown graphically in Figure I.

The students who have been labeled "dramatic" were not students of the writer and had no opportunity to become acquainted with any vocal "tricks" which may be peculiar to his method of expression. Those students at the "high" end of the scale were from the cast of the spring production of the leading campus dramatic society and are acknowledged by many as among the best talent the campus affords.

C. Sex differences.

Further observation of Table I will demonstrate the fact that the male observers scattered more widely and made both higher and lower scores than the female observers. In the Barnard Alphabet, the Ohio State Selections and Alphabets the grouping of male and female have the same approximate relationship, i.e. slightly higher general average for the female and a wider scatter with lower and higher limits for the male.

The distribution sheets show the same scattering of the sexes. The males have a larger percentage of correct responses, and a larger number of individual responses than the opposite sex. The median for males on the total score is 13 and for females between 14 and 15.

D. A few correlations.

In an attempt to find the relationship between parts of the total score the following correlations

were computed by the Pearson product moment method. P. E. in each case is negligible due to the large number of cases.

O.S.U. selections and O.S.U. alphabets; r = +0.20
O.S.U. selections and Barnard " ; r = +0.13
O.S.U. alphabets and Barnard alphabets; r = +0.21
O.S.U. record and Barnard record; r = +0.22

These are indicative of a low degree of relationship between the discrimination of meaningful material with word sounds, meaningless material with inflection only, and meaningless material with cue sounds. The combined score is then a more or less accurate measure of an individual's ability to discriminate between vocally expressed emotions.

In regard to the relation of the total score on this test and the University Intelligence test, 55 students equally distributed among the upper and lower third of an elementary class were investigated. A correlation of +0.18 was found between total score and the intelligence test rating. The sampling chosen was such that if any degree of correspondence were present, it would have been evidenced.

E. Summary of answers to questions.

1. An inspection of the answers to the questions on Forms A and C reveals several interesting features. The matter of age and college class was not checked. Approximately 50% of the observers were freshmen with the other half distributed over the other three classes and the graduate schools. Class standing has very little effect upon total score.

It was not possible to check nationality as a factor and to get comparative ratings of nationalities as students did not indicate the facts in such a manner that their answers could be used.

In reply to the query, "Are you slow, medium, or quick in reacting to emotional stimuli?", almost one third acknowledged belonging to the third grouping. Males were willing to admit the first grouping in double the number of female cases. The sexes were on a par in respect to the next three questions and admit that

music, sad motion pictures, and happy endings affect them to greater or less degree. To the question, "which do you think best expresses emotion in actors?", over fifty percent of the cases replied "voice" -- indicative perhaps of some preference for the spoken play to the cinema.

The other question on the information sheet which has not been discussed was that of mood. The writer had observed Dr. C. A. Ruckmick's experiment on the discrimination of facial expression where it was found that the mood of the observer influenced his reaction decidedly, and introduced this particular query on the supposition that it might prove significant. It was found in this study, however, that the mood of the observer did not affect his reaction to any appreciable extent.

To the question at the bottom of Form C in which the students were asked if selections or alphabets were most easily discriminated about 668 responded "selections" 152, "alphabets," and 77 did not respond. The reason for discrimination was about evenly divided between pitch and inflection, 102 not responding.

E. Comparison with other experimentation.

For the Barnard College record the following order of correct responses was found:

1.	Unhappy (Alphabet 2)	82.2 per cent
2.	Mirth	78.0
3.	Scorn	66.2
4.	Fear	48.8
5.	Anger	42.8
6.	Unhappy (Alphabet 9)	40.5
7.	Pity	32.2
8.	Surprise	29.6
9.	Suspicion	21.7
10.	Defiance	8.8

(Note -- It is interesting to note in this collection that the experimenter at Barnard placed the 9th "unhappy" in the record because she deemed the second one was incorrectly done.)

For the O. S. U. selections the following order prevailed:

1. Sorrow	82.6 per cent
2. Anger	66.2
3. Terror	57.7
4. Mourning	53.6
5. Mirth	46.5
6. Admiration	47.9
7. Scorn	25.2

For the O. S. U. alphabets the following:

1. Fighting Mad	82.3 per cent.
2. Anger	76.5
3. Personal Grief	59.3
4. Self Assertion	55.3
5. Sorrow	47.6
6. Mirth	37.7
7. Fear	26.2
8. Admiration	30.2
9. Defiance	5.3

On the whole, the above results tend to agree with Ruckmick's observation that the more frequent correct discriminations are among the more primary emotions, but the orders suggested by Langfeld and Allport both of which ranked mirth or happiness at the top, for discrimination of facial expression only, do not hold true for auditory stimuli, at least for those presented in these records. It is interesting to note that in both the Barnard and O. S. U. records, the sorrowful emotions are in the lead and anger and fear rate well toward the top. The writer, of course, would not include in the list, all of the so-called primary emotions; wonder, and self-abasement, having been omitted entirely. The six lists are presented in graphic form in Table III. If the same emotions had been attempted in all five sorts of investigation, namely, the three vocal means used in the records and male features (Allport and Langfeld) and female features (Ruckmuck's) would have been comparable.

Generalizing from emotional states common to all methods one might ask the question "Which emotions are

Table III.

Vocal Stimuli			Visual Stimuli			
O.S.U. Selections	O.S.U. Alphabets	Barnard Alphabets	Langfeld	Allport	Ruckmick	
(900 observers)			(6 obs.)	(48 obs.)	(12 obs.)	
Sorrow	Fighting Mad	Unhappy	Laughter	Laughter	Love	Primary Emotions
Anger	Anger	Mirth	Amazement	Bodily pain	Hate	Primary Emotions
Fear	Personal Grief	Scorn	Bodily pain	Fear(horror)	Joy	Primary Emotions
Mourning	Self Assertion	Fear	Hate	Distrust(hate)	Sorrow	Primary Emotions
Mirth	Sorrow	Anger	Fear(anxiety)	Amazement		
Admiration	Mirth	Unhappy	Disgust	Anger	Repul-siveness	Secondary Emotions
Scorn	Fear	Pity	Doubt	Doubt	Surprise	Secondary Emotions
	Admiration	Surprise	Anger	Disgust	Distrust	Secondary Emotions
	Defiance	Suspicion			Defiance	Secondary Emotions
		Defiance				

best recognized by visual means and which by auditory?" and from Table III might infer that sorrow, fear and rage are best expressed by voice, and joy, pain, and distrust by facial expression.

Comparing the three lists from this experiment it may be noted that the Ohio State selections and the Barnard alphabets are more alike than the two parts of the Ohio State record. In the Barnard record the recordings were made by a female voice, was used. The difference in sex and the greater power of the chest tones may account for the presence of mad, anger, etc. -- emotions calling for strong chest tones -- at the head of the Ohio State list. Further experimentation should be made using both facial and vocal expressions in order to obtain a complete analysis of the problem of emotional expression.

G. Opinions of Observers.

The opinions which were obtained from the observers at the close of the experiment show a very wide scattering and difference of opinion. Individual differences, evidently, are present. The women gave their opinions much more freely than did the men and did not vary as widely in their reactions. Quite a number of both sexes object to an unfortunate rapidity of the selections and others made the remark that the record was very unpleasant or very disgusting. It is interesting, however, to note that at least some emotional disturbances -- whether pleasant or unpleasant -- were brought forth in the individuals who listened to the records. This at least indicates that the recording achieved a certain degree of success.

A few of representative introspections follow:

1. "The records were adequate as gestures, facial expressions, etc. are unnecessary. If the words could not be distinguished, the pitch and tone were sufficient. On the whole, I preferred the alphabet."
6 6 4 - 12. (This observer did the alphabets better)

2. "I did not enjoy listening to the alphabets but did enjoy some of the selections. The speaker has a marvelous range and inflection of voice. I knew most of

the selections and said them over with the speaker." (This person is a member of the Harman summer stock company.) 8 6 6 -20.

3. "The record did not affect me in any way. It seems only to be a matter of elucidating with regard to pitch of voice, the pitch of expression, tone and a few other factors. However, the experimenter is limited in certain respects with regard to the time factor. If a little longer time were allowed, with the record played once, I think the results would be more pronounced." 4 3 2 -9.

4. "The record made me doubtful as to what they were trying to impress me with, especially the first time through. It sounded like a part of a play that one might expect any kind of death to follow or to have just taken place, as was the case of one. The next time over it was clearer, but didn't affect me much." 2 3 1 -6.

5. "In regard to the first one, the little gargle before each line of letters was an influencing factor in my choice. Sometimes I could relate the selections to a scene in a play which I had seen." 5 3 2 -10.

6. "The only feeling or emotional sensation which I experienced was disgust at the silly method by which the reactions required were sought. If order and clarity were implied in the exposition of the artist or artists reciting the pieces, the selections would be a little more intelligible. My spelling of various words used in the answers may be accounted for by the fact that three years of my college life has been spent in the engineering department where such things are only taught to those who elect them." (Selection 3, which he thought was devotion, was the only part having any emotional effect on me.) 4 5 2 -11.

7. "On the selections that I could not place right away I actually did give some gestures. The state of the reader on the record was fixated in my mind. I could picture her or his gestures in my mind, such as wringing of hands, manual movements in rage, etc." 5 6 5 -16.

8. "I felt like shouting them out, speaking with them. Some of the selections seemed too short to get the idea and too hurried. I thought I was quick to react, but but after this, I have my doubts." 4 5 6 -15.

9. "Many images went through my mind, but when the record was finished, I felt singularly breathless and tense. Perhaps that was because I was on the alert to catch the inflections of the voice. It was more pleasant than unpleasant." 5 7 6 -18 (A girl with 8 years training in public speaking.)

The figures after each report indicate the score made by the observer. The first figure is the score on the Barnard alphabets (possible 10), the second the Ohio State alphabets (possible 9), the third Ohio State Selections (possible 7), and the last figure the total (possible 26).

The observer's attitude corresponds roughly with his total score as may be seen from Nos. 3, 4, 6nd 6 with low scores and Nos. 2, 8, and 9 with high scores. Only about thirty per cent of the 900 observers responded in this way, hence the avoidance of more definite use of the results obtained. In dealing with an individual case, or in using the records for a clinical study in a speech laboratory, these introspections would be more indicative than when taken as a group response.

An inspection of the reports shows that of those who were affected by the record, over 80% had imagery of some sort or were moved to motor responses were above the group median and ranged from 9 to 21 in total score; while of those who were disgusted, displeased or not affected, 60% scored below the group median and ranged from 5 to 18 in total score.

H. Using form D.

No conclusive evidence was found as to the superiority of Form D over form A as only 78 observers were used. The median score is one point lower for Form D. than for the 900 cases tested with form A. Ease of scoring is the only advantage evident and new norms will have to be devised before this method will be of any value.

II. Individual Method.

The results from the group method were more significant than those obtained from the individual method. In the individual method since the blood pressure readings did not vary any more than would be expected under normal circumstances, they were therefore not recorded. The majority of the 62 cases were not disturbed by the record, either as indicated by the physical measures used or in their introspections given at the time of the experiment. This is undoubtedly due to the fact that the record was not new and consequently they were not affected thereby.

The Respiration curves are also, in all but the nine cases shown in Figure IV, of very little value. They correspond in the main to curve K on Figure II. The stimulus in each case is too brief, in addition to being too familiar, for significant results. Curves b, c, e, h, and i (Figure II show much more variation than the average individual.

The writer placed his own curve first (a. Figure IV) after the manner of Feleky's study (10).

A general similarity may be noted in the response to IV or Rage in Curves a, b, d, and f, but is not sufficiently marked to be considered of any value.

Curve i indicates an interesting development and a possible line of future research. This observer had the role of Fritz in "The Enemy" by Channing Pollock and had given the campus a very fine portrayal of a young German, afraid to go to war. The experimenter asked him to give a portion of one of his scenes, both aloud and thought through silently. As is evidenced by the diagram, the same sort of breathing is common to both methods of expression.

Reactions to the Laughing Record.

In twelve cases, the laughing record described in Chapter IV was played after the completion of the above mentioned experiment. As before, no significant changes in blood pressure were noted although there was a

slight increase in those cases. The respiration curves from these twelve cases are to be found in Figure III and a rather striking resemblance to Miss Feleky's is evident. If the observer was affected by the record his respiration curve shows the typical response noted in her study: if not, as in i, h, and l, the curve is unaffected. In this case the stimulus was three minutes in length and it is suggested that in further studies the vocal stimulus be nearer that length than the twenty seconds allowed in the present study. Striking individual differences, due doubtless to different ways of reaction to the laughter situation may be noted in the examples in Figure VI.

Suggested modifications of present procedure.

The present procedure should be modified so as to include longer selections both of alphabets and literature with convenient stops between each of the various stimuli in order to provide opportunity to check each emotional presentation. In this study the total affect of the record is all that could be obtained by pneumograph and blood pressure readings.

The observers to be used for the individual method should be studied individually before listening to the record in a group. It is also suggested that a dark room and an electrically driven kymograph or polygraph would give better results.

VI. CONCLUSIONS

A. Findings from this study.

The findings from this particular investigation may be summarized briefly as follows:

I. The method used in this study is evidently a measure of dramatic ability and further investigation along this line should prove profitable.

II. No previous study has been found which approaches the problem in this particular fashion.

III. The traditional sex differences are brought out again in the greater variability of male observers in their responses, both at the higher and lower end of the scale and in the average higher scores of the female observers. All three parts of the experiment verify these findings.

IV. Alphabets are slightly better for test purposes than content material.

V. A larger number of observers prefer selections to alphabets but their scores indicate that they make a better record on alphabets.

VI. The work of Dr. Gates in use of the Garnard College record with children is extended to the point of securing the formation of norms for the normal college adult level.

VII. Introspections show that a longer test than the Barnard or the Ohio State record is better for predicting emotional discriminative ability.

VIII. The use of a record giving larger duration to one emotion indicates that for future research longer stimuli would be more desirable than those used in this study.

IX. Emotional discriminative ability evidently has a degree of correlation with dramatic achievement.

X. It is probable that emotional discriminative ability has but little positive correlation with The University Intelligence Test Scores.

XI. The various parts of the test have sufficiently low degrees of correspondence to be worth putting together to make up the total score.

XII. The majority of the students questioned admit being affected by music, by sad motion pictures, and unhappy endings to plays or novels.

XIII. The prevailing opinion as to the best method for expressive emotion in actors is that chosen for this experiment -- voice.

XIV. Prevalent mood does not, as reported at the beginning of the experiment, affect the reactions of the observer, but his introspective report shows that a disgusted or unpleasant attitude is conducive to a low total score, while a pleased or cooperative attitude tends toward a higher score.

XV. The relative ease of discriminating emotions expressed by voice varies decidedly from those expressed by facial expression and these results agree more with the findings of Ruckmick than with those of Allport and Langfeld.

XVI. Sorrow, fear, and rage are more easily recognized when expressed by voice than by facial expression alone, while the reverse is true of joy, pain, distrust and disgust.

XVII. The results of the expressive methods used in this experiment are equivocal and can not be used in the conclusions.

XVIII. Feleky's conclusions on the respiratory curve for laughter are verified by this study.

XIX. The need for an orientation and standardization of emotional vocabulary is evident from the responses to the record.

B. Suggestions for Future Research.

In addition to the incidental suggestions which may be contained in the preceding paragraphs, the writer deems it well to suggest that in place of the alphabet, or selections from English literature, selections in a foreign language be given, particularly Italian, French and German, using if possible the intonations peculiar to the English interpretation of the emotion. This would eliminate the error noticed in the reactions to some of the literature selections, in which it was very evident that the observer reacted to certain words in the selection rather than to the total emotional situation contained therein.

A more practical method of conducting research along this line would be to use both phonograph and moving picture representations together and separately. A few preliminary attempts were made in connection with experiments with photography which seemed to indicate a method of experimentation along this line. To determine the effect of various American dialects upon the observer would be another interesting study. An investigation of this sort has been started but as yet has not been carried to completion.

In connection with the detection of dramatic ability in students, the writer suggests that this, or a similar experiment be made with entering students in one of our various dramatic departments and the results correlated with the class-room results of the various students at the end of the year. This would test further the validity of such procedure. It is the writer's intention to carry on this research in something of this manner.

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AUTOBIOGRAPHY

Lester Raines was born in Milford, Illinois, July 23, 1896. He received his secondary school education in the public schools and township high school of the same village; his undergraduate education at the University of Illinois; and his graduate training at the University of Illinois; Carnegie Institute of Technology, Division of Applied Psychology; Harvard University; and The Ohio State University. He received the A. B. and A. M. degrees from the University of Illinois in 1918 and 1920. While at the University of Illinois he was a student assistant and from 1918 to 1920 taught in secondary schools in the state of Illinois except for a period of six month's World War service.

From 1920-1922 he was an Instructor in the University of Pittsburgh; during the summer of 1921 a visiting Instructor in Dramatics at Harvard University; from 1922-1924 an Assistant Professor in Speech at Iowa State College; from 1924-1926 Assistant Professor and Director of Dramatics at the University of Minnesota; from 1926-1927, Professor and Head of Public Speaking, Otterbein College; and from 1927-1928 an Instructor in Psychology at The Ohio State University. He completed the requirements for the Ph. D. degree in August 1928.

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